

UNITED STATES PATENT OFFICE

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PROPELLANT EXPLOSIVE

No Drawing.

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My invention relates to an improvement in propellant explosive powders, the object being to produce a propellant powder of such a character that small charges of it will burn uniformly and that it will leave no corrosive residuum to act on the material of the barrel of the firearm in which it is used.

With these ends in view my invention comprises a propellant powder consisting essentially of a nitrated organic compound, a heavy metal nitrate, sulphur, charcoal and basic lead nitrate. More specifically, my improved propellant powder comprises gun cotton, barium nitrate, sulphur, charcoal and basic lead nitrate.

In carrying out my invention, I employ the above named ingredients in substantially the following proportions, dependent on the specific use to be made of the compound: barium nitrate 51%, charcoal 9.5%, sulphur 7.5%, basic lead nitrate 17% and gun cotton 15%.

It is well known to those skilled in the art that, in the case of small caliber rim fire cartridges wherein a small charge of propellant powder is used, it is difficult to use the ordinary smokeless powders of commerce, owing to the fact that such powders will not burn uniformly under the conditions presented when used in such cartridges. On this account and in order to produce cartridges of the type described, having a high degree of accuracy when used, it has been customary in the past to use various so-called "semi-smokeless" powders in such cartridges. These "semi-smokeless" powders comprise varying mixtures of gun cotton with ordinary black powder. Black powder is a mixture whose chief ingredients are charcoal, sulphur and potassium nitrate.

It is well known that the oxide, hydroxide, and salts of the alkali metals and in particular of potassium are highly hygroscopic. As a result of this fact the residues from these "semi-smokeless" powders deposited in the

barrel of the firearm in which they are used have a highly corrosive or rust producing effect thereon, owing to the absorption by them of moisture from the air, dissociation therein and consequent effect upon the metal of the barrel.

In compounding the mixture the sulphur, charcoal, barium nitrate and basic lead nitrate are first made into a compacted and granulated mixture by the methods ordinarily used for the manufacture of black powder. The gun cotton used is very finely shredded gun cotton which has not been colloided in any way. It is mixed with black powder, made as above described, in a mill with sufficient water to render the mass plastic. When the mixture has been thoroughly incorporated, it is dried, grained, polished, sieved, etc. as is well known in the art.

I am aware that propellant powders have been made in the past in which a small proportion of the potassium nitrate has been replaced by barium nitrate, but none of these powders has been commercially successful, nor did any of them accomplish the result attained by my invention in which the compounds of alkali metals are entirely eliminated.

My invention is not restricted to the precise percentages shown above as these are merely the preferred percentages for use in one specific small caliber rim fire cartridge and these proportions may be varied to meet the individual requirements of other cartridges in which the ingredients are to be used.

In place of gun cotton I may substitute another nitrated organic explosive such as nitro-glycerine, nitro-starch, nitro-sugar, etc. in which case the relative proportions of the ingredients will, of course, be altered to meet the conditions required.

I claim:

1. A propellant powder, comprising a ni

trated organic compound, charcoal, sulphur and basic lead nitrate.

2. A propellant powder, comprising gun cotton, charcoal, sulphur, barium nitrate and basic lead nitrate.

3. A non-corrosive propellant powder comprising a nitrated organic compound, sulphur, charcoal, a heavy metal nitrate and basic lead nitrate.

4. A propellant powder, comprising substantially: barium nitrate 51%, charcoal 9.5%, sulphur 7.5%, basic lead nitrate 17% and gun cotton 15%.

In testimony whereof I affix my signature.

JOSEPH D. McNUTT.